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Antimicrobial Activities of Synthesized Gold Nanoparticles against *Escherichia coli* and their *in-vitro* Toxicity Assessment

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Safe drinking water in an urban city has been a great challenge for human population. Consumption of contaminated water may lead to occurrence of several diseases. Enterotoxigenic *Escherichia coli* (ETEC) is an enteric pathogen which can survive even in treated drinking water and cause watery diarrhea. The pathogen harbours virulent and drug-resistant genes responsible for its virulence and antibiotic resistance. Persistence of such strains of ETEC are often associated with disease outbreaks. The present work involves antimicrobial activity of synthesised Gold nanoparticles against ETEC, isolated from drinking water. Gold nanoparticles (AuNPs) were synthesized using biological approach and characterised by UV-visible spectroscopy and Electron Microscopy. The morphology of nanoparticles was found to be quite spherical within the range of 20-30 nm. AuNPs were effective as antimicrobial agent against ETEC. Cytotoxicity assay was performed to evaluate the toxicity of synthesized nanoparticles. It was evaluated by using sulforhodamine B (SRB) assay on Vero cell line. Study revealed that the synthesized AuNPs do not exhibit any toxicity within the experimental range of antimicrobial concentration of AUNPs and therefore these are safe.

Keywords: Enterotoxigenic *Escherichia coli*, Drug-resistance, Gold nanoparticles and Cytotoxicity.